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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
10/622,646	07/21/2003	Tetsuroh Murakami	204552019310	4539

25227 7590 08/10/2004

MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 300
MCLEAN, VA 22102

EXAMINER	
KANG, DONGHEE	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/622,646	MURAKAMI ET AL.	
	Examiner	Art Unit	
	Donghee Kang	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-23* is/are allowed.

6)☒ Claim(s) *6,11-14 and 18-20* is/are rejected.

7)☒ Claim(s) *7-10 and 15-17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/761,829.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07-21-03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. This application appears to be a division of Application No. 09/761,829, filed 01-18-2001. A later application for a distinct or independent invention, carved out of a pending application and disclosing and claiming only subject matter disclosed in an earlier or parent application is known as a divisional application or "division." The divisional application should set forth the portion of the earlier disclosure that is germane to the invention as claimed in the divisional application.

Information Disclosure Statement

2. Acknowledgment is made of receipt of applicant's Information Disclosure Statement (PTO-1449) field 07-21-03.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 6 & 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugawara et al. (US 5,153,889).

Re claim 6, Sugawara et al. teach in Fig.38 a light emitting diode of a double hetero-junction type in which a light-emitting layer made of a GaAlInP material (343) is interposed between a p-type cladding layer (344) and an n-type cladding layer (342), wherein:

a p-side electrode (350) is formed on a p-type cladding layer-side surface having an area of 0.15 mm^2 or more (Col.35, lines 45-49); and

any point present in a range not containing the p-side electrode of said p-type cladding layer-side surface is within a distance of (Ldx2) from some point on an edge of said p-side electrode, where Ld is a distance from a position at which an optical power is maximum, to a position at which the optical power attenuates by 90%. See also Col.35, line 10-61.

Re claim 14, Sugawara et al. teach in Fig.38 a light emitting diode of a double hetero-junction type in which a light-emitting layer made of a GaAlInP material (343) is interposed between a p-type cladding layer (344) and an n-type cladding layer (342), comprising:

a current blocking layer (347) formed on a p-type cladding layer-side surface having an area of 0.15 mm^2 or more (Col.35, lines 45-49); and

a p-side electrode (350) is formed at a position above said current blocking layer and opposed to said current blocking layer, wherein

any point present in a range not containing the current blocking layer of said p-type cladding layer-side surface is within a distance of (Ldx2) from some point on an edge of said current blocking layer, where Ld is a distance from a position at which an optical power is maximum, to a position at which the optical power attenuates by 90%. See also Col.35, line 10-61.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 11 & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara et al. in view of Lee et al. (US 6,057,562).

Sugawara et al. teach the light emitting diode comprising a current diffusion layer (348) made of a GaAlAs material and disposed between said p-type cladding layer and said p-side electrode. Sugawara et al. do not teach the current diffusion layer made of AlGaInP material. Lee et al. teaches in Fig.5 the light emitting diode includes a current diffusion layer made of AlGaInP (56). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the GaAlAs of Sugawara with AlGaInP material as taught by Lee since GaAlAs and AlGaInP materialsr are art recognized current diffusion material for light emitting diode.

7. Claims 12-13 & 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara et al. in view of Nisitani et al. (US 5,732,098).

Sugawara et al. do not teach a light emitting diode further comprising a barrier layers between said light emitting layer and said p-type cladding layer, and between said light emitting layer and said n-type cladding layer, said barrier layer having a band gap intermediate between band gaps of said light-emitting layer and p-type cladding layer.

Nisitani et al. teach in Fig.5 the barrier layers (44 & 83) located between said light emitting layer (61) and said p-type cladding layer (84), and between said light emitting layer and said n-type cladding layer (43), said barrier layer having a band gap intermediate between band gaps of said light-emitting layer and p-type cladding layer. See also Col.3, line 9 – Col.4, line 5. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Nisitani into the Sugawara's device in order to improve the crystal quality of each interface between the clad layer and active layer hence obtaining a high brightness and long service life.

Allowable Subject Matter

8. Claims 21-23 are allowed.

Claims 7-1- & 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance and indicating allowable subject matter.

Prior art reference, taken along or in combination, do not teach or render obvious that the p-side electrode is formed on a p-type cladding layer side surface, said p-type electrode consisting of a plurality of mutually connected constituent parts; and any point present in a range not containing the p-side electrode of said p-type cladding layer-side surface is within a distance of (Ldx2) from some point on an edge of said p-side

electrode, where Ld is a distance from a position at which an optical power is maximum, to a position at which the optical power attenuates by 90%.

Prior art reference, taken along or in combination, do not teach or render obvious that any point present in a range not containing the current blocking layer of said p-type cladding layer-side surface is within a distance of (Ldx2) from some point on an edge of said current blocking layer, where Ld is a distance from a position at which an optical power is maximum, to a position at which the optical power attenuates by 90%, wherein the current blocking layer comprises a plurality of blocking branch portions and a connection portion connecting said blocking branch portion to each other electrically, and an interval between adjacent blocking branch portion is approximately Ld.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 571-272-1656. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Donghee Kang, Ph.D.
Primary Examiner
Art Unit 2811

dhk